AC Power Distribution Panel
PN 8404/ PN 3404/ PN 8482/ PN 3482/ PN 8484/ PN 3484
PN 8504/ PN 3504/ PN 8582/ PN 3582/ PN 8584/ PN 3584

Panel Specifications
Material: 0.125” 5052-H32 Aluminum Alloy
Primary Finish: Chemical Treatment per Mil Spec C-5541C
Final Panel Finish: Graphite color 2 part textured Polyurethane
Amperage Rating: All components are sized for 100 Amps of continuous current
Voltage Rating: See Panel Features
Meter: AC Digital Multimeter with Alarm PN 8247
Overall Dimensions: PN 8404/8504 5-1/4 x 7-1/2 133.40 x 190.50
PN 3404/3504 5-1/4 x 7-1/2 133.40 x 190.50
PN 8482/8582 14-3/4 x 7-1/2 374.65 x 190.50
PN 3482/3582 14-3/4 x 7-1/2 374.65 x 190.50
PN 8484/8584 14-3/4 x 11-1/4 374.65 x 285.75
PN 3484/3584 14-3/4 x 11-1/4 374.65 x 285.75

Panel Features
PN 8404 / 3404 / 8482 / 8484 / 8484 - 120 Volts AC
• 15 Ampere branch circuit breakers installed
PN 8504 / 3504 / 8582 / 8584 - 230 Volts AC
• 8 Ampere branch circuit breakers installed

Applicable Standards
• United States Coast Guard 33 CFR Sub Part 1, Electrical Systems.

Installation

1. Disconnect all AC and DC power
Disconnect all AC power originating on or off the vessel. This includes inverters, generators, shore power attachments and any other device capable of supplying AC power to the ship’s circuits.

Disconnect the main positive DC cable from all batteries to eliminate the possibility of a short circuit and to disable the inverter while installing the distribution panel.

2. Select mounting location and cut opening
This panel is not intended to serve as the main AC circuit breaker panel. A double pole circuit breaker that breaks both the AC hot and neutral legs (such as Blue Sea Systems’ PN 8029) must be installed in a location which is not more than 10 feet from the shore power inlet or the electrical attachment point of a permanently installed shore power cord as measured along the conductors of the feed wires.

Select a mounting location which is protected from water on the panel front and back and is not in an area where flammable vapors from propane, gasoline or lead acid batteries accumulate. The circuit breakers used in marine electrical panels are not ignition protected and may ignite such vapors.

Using the panel template provided, make a cut out in the mounting surface where the distribution panel is to be mounted. Do not yet fasten the panel to the mounting surface.

3. Install branch circuit wires
Determine the proper wire size for each branch circuit using the wire sizing chart. Verify that the standard circuit breakers installed in the panel are correct for each branch circuit. Remove and replace any that are incorrectly sized. The circuit breaker must have a rating less than the allowable amperage of the wire, yet greater than the circuit’s continuous current.

Connect each branch circuit hot (black) to the appropriate load terminal. Connect each branch circuit neutral (white) to one of the screws on the neutral bus. Connect each branch safety ground wire (green) to one of the screws of the safety ground bus.

Do not confuse the neutral current carrying wires (sometimes called ground) with the green normally non-current carrying wires (sometimes called grounding). These two wires must be connected only at the source of power, nowhere else.

Wire sizing chart
Use the wire sizing chart below to determine the minimum branch and feed circuit wire sizes.

<table>
<thead>
<tr>
<th>Wire Size (AWG)</th>
<th>Allowable Amperage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outside Engine Spaces</td>
</tr>
<tr>
<td>16</td>
<td>25.0</td>
</tr>
<tr>
<td>14</td>
<td>35.0</td>
</tr>
<tr>
<td>12</td>
<td>45.0</td>
</tr>
<tr>
<td>10</td>
<td>60.0</td>
</tr>
<tr>
<td>8</td>
<td>80.0</td>
</tr>
<tr>
<td>6</td>
<td>120.0</td>
</tr>
<tr>
<td>4</td>
<td>160.0</td>
</tr>
<tr>
<td>2</td>
<td>210.0</td>
</tr>
</tbody>
</table>

Note: This chart assumes wire with 105° C insulation rating and no more than 2 conductors are bundled. Not suitable for sizing flexible shore power cords.
4. **Install feed circuit wires**

Install the feed wires from the AC main circuit breaker panel or other AC source, referring to the wire sizing chart to select the minimum wire size. Connect the black AC hot, white AC neutral and green AC safety ground to their corresponding buses. In the case of 3 column panels, the black AC hot, white AC neutral and green AC safety ground should be connected to the middle bus structure.

5. **Installation of Backlight System**

The backlight board is a DC device. When installing it in an AC panel both wire leads must be connected to an appropriate DC source and ground.

Connect the yellow negative wire to a DC ground. Connect the red positive wire to any DC positive supply, usually a switch that controls the vessel’s other nighttime illumination.

6. **Apply branch circuit labels and mount panel**

Apply a label for each of the branch circuits from the 30 basic labels provided. If the appropriate label is not included, the Extended Label Set of 120 labels may be ordered from your marine supplier (PN 8067). Individual labels are also available from Blue Sea Systems for specific applications. Refer to the label order form for a complete listing of individual labels.

Fasten the panel to the mounting surface using the panel mounting screws supplied with the panel.

7. **Testing**

- Using a multimeter where the power source is connected to the panel verify:
  - PN 8404 / PN 3404 - 120 Volt AC
    - a. 120 volts between hot and neutral (nominal, this may vary depending on source voltage)
    - b. 120 volts between hot and ground.
    - c. 0 volts between neutral and ground.
  - PN 8504 / PN 3504 - 230 Volt AC
    - a. 230 volts between hot and neutral (nominal, this may vary depending on source voltage)
    - b. 230 volts between hot and ground.
    - c. 0 volts between neutral and ground.

   ✅ Turn on each branch circuit to verify power to each circuit.

8. **Optional Branch LED’s**

This Panel is supplied with LED’s pre-installed in all optional branch positions. For future expansion of the panel remove the hot leg of the LED from the AC Neutral Bus and connect it to the Load side of the branch circuit breaker.

**Note**

- All Blue Sea Systems’ AC electrical distribution panels are furnished with 15 amp or 8 amp circuit breakers for branch circuits. 15 amp circuit breakers are used in all 120 volt panels and 8 amp circuit breakers are used in all 230 volt panels. These ratings were selected to minimize the need for removing the panel’s circuit breakers and reinstalling different size circuit breakers. It is very rare to have more than this amount of current flowing in any one circuit. Therefore, these circuit breakers will satisfy the vast majority of marine circuit protection situations.

**The Purpose of a Panel**

There are six purposes of a marine electrical panel:
- Power distribution
- Circuit (wire) protection
- Circuit ON/OFF switching
- Reverse Polarity Indication
- Metering of voltage and amperage (In panels with meters)
- Condition Indication (circuit energized)

**Useful Reference Books**


**Wiring Diagram**

AC Power Distribution Panel with AC Digital Multimeter

(PN 8404 / PN 3404 shown for reference)